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An Angler's Best Friend

'An angler is a primeval man," claimed a writer 30 years ago in the *Game Bulletin*, forerunner of *Washington Wildlife*. "He pits his knowledge and skill against the wiles of the unknown." While he acknowledged the angler's debt to modern fishing aids, the writer gave his highest praise to a "scientific program of replenishment" that was just then gaining a foothold.

Lake rehabilitation as an official Game Department program was created in 1946. The department's 1946-48 biennial report praised the effort this way:

Of all the programs inaugurated this biennium, none promises to do more for game fish propagation than lake rehabilitation, commonly called lake poisoning.

By 1950, use of a chemical called rotenone was the preferred way to rid waters of unwanted fish, and it has remained in favor to this day. When rotenone became commonly available to fishery managers, it was none too soon. A cheap, safe, easy-to-use means of cleaning out lakes prior to restocking had been high on fish culturists' wish lists for a long time.

The account of why and how lake rehabilitation came about takes us

back to Europeans' earliest visits to this continent. A big part of early America's economy was based on the exporting of salted fish. It's said that England gained more from the New World's salted fish than Spain did from its gold.

Even before the pilgrims landed, fishing ships stopped on our Northeast shores to salt and dry their catch before returning to the mother country. Both Catholic Europe and Protestant England followed the no-meat-on-Friday custom, and their demand for salted fish seemed insatiable.

It took a bushel of salt to cure 100 pounds of fish, and the salt boiling industry took plenty of firewood. Mining, logging and farming practices of the early settlers combined to have a tremendous impact on the environment, and particularly on fish habitat. As inland fisheries became depleted and marine fish stocks began to fluctuate widely from year to year, the American public began to take notice. While they did not completely understand why the fish were disappearing, they knew something had to be done.

The most obvious way to pump life back into the sagging fisheries resource was to import adult fish into depleted waters to improve broodstock. A thriving industry sprang up around the science of fish culture; more and more

people collected eggs and fry and transported them to fished-out waters.

The explosion of interest in fish culture got into full swing about 1850. Some entrepreneurs were turning a sizeable profit in the new fish-production industry, and their primary goal was finding a way to produce the ideal "table trout."

The brook trout was the early darling of fish culturists, but by 1870, efforts at fish propagation included species like the Atlantic salmon, American shad, whitefish, lake trout, yellow perch and largemouth bass. The northern pike had already found a foothold by incidental means in several states outside its native range, and the incredibly hardy carp was introduced by a private citizen in 1831 in New York.

Another article from the *Game Bulletin* in the early 1950s reflects the Game Department's view of the carp as an implacable enemy. It mentions the "... relentless campaign against scrap fish, the most resistant of these many species being the carp. To illustrate the danger," the writer continued:

... a six-pound female carp can produce 1,500,000 eggs a year; by comparison, a six-pound trout will produce only about 4,000 eggs. From this it is easy to see why carp populations soon outstrip those of game species which try to compete in the same waters.

Referring again to the carp, the article claimed that "As food they are extremely bony and almost always have a muddy flavor." However, the writer admitted that in Japan and other parts of the Orient, carp had found a place as a food fish — and for other uses:

Russians today are reported to be using carp to tend rice fields in the Kazak Republic. Tass, the Soviet news agency, states that 200,000 yearling carp have been placed in the inundated rice paddies, and these fish in search of food destroy rice pests and malarial mosquito larvae. They also stir up the mud, helping in the growth of rice plants, and reputedly increase the rice yield by some 150 pounds an acre.

Whether or not the Russians are still using carp for "paddy patrols," this ubiquitous fish is still held in high or low regard, depending on which part of the world you happen to live in.

By 1890, the carping about proliferation of carp and other often undesirable fish species was growing around the country. While there were other methods

tried to rid waters of unwanted species, the ultimate solution appeared to be some kind of poison that would kill offending fish while not poisoning the environment.

In October 1913, the first known attempt to remove undesirable fish populations from a lake occurred at Silver Lake, Vermont. The lake was treated with 6,300 pounds of copper sulphate that was dragged over the lake's surface in burlap bags. The lake was small, with a surface area of under 65 acres and a maximum depth of 25 feet. Populations of pickerel, yellow perch and a few other species were killed, but a few hardy pike managed to pull through.

Copper sulphate was subsequently used at a lake in New Hampshire to kill pickerel in a trout pond. Further experimentation with the compound was carried out to find what concentrations were needed under varying water conditions and for different fish species.

Over the next two decades, other chemicals were tried, but neither they nor copper sulphate would turn out to be totally satisfactory. In most cases, the poisoning agents were simply too harmful to desirable plants or to other fish and wildlife. It was not until the coming of rotenone in the 1930s that lake rehabilitation became a real possibility for desperate fishery managers.

Widespread use of rotenone today has made many people aware that it comes from the roots of a South American plant and that it has been used for centuries by natives to bring fish to the surface, where they can be skimmed off by hand. But few know that plants containing rotenone were used in fishing by not only South American Indians, but by North American Indians and some Asian peoples as well.

It was not until the importation of rotenone on a commercial basis in 1928, however, that the chemical became a feasible fish management tool. The first supplies came from Sumatra, but a practical source was found in 1931 in this country, from a plant called *Tephrosia virginiana*. Experiments showed that an extract from the roots of this plant was as deadly to fish as pure rotenone. Other sources have since been found, and varieties are grown commercially in South America for importation into the United States.

At first rotenone was used primarily as an insecticide, but in 1934 two small



Rotenone has become the primary weapon against such "scrap fish" as the carp, above, which were salvaged after an early lake rehabilitation.

Game Department photo

ponds in Michigan were treated with weak concentrations of the chemical, and the results were so promising that more tests followed. The success of the new fish management technique was universal, and in 1938 a new twist was added. At Fish Lake, Utah, selective fish poisoning was achieved by spreading the rotenone along the shoals of the lake where the unwanted species, chub, came to spawn.

Washington has long been one of the most active states involved in lake rehabilitation work, having started with experiments in 1940. In 1949, the *Game Bulletin* noted that:

Approximately 60 percent of the nation's 1949 lake "poisoning" activities was carried out in the State of Washington by members of this department. In the year of 1948, 41 percent was done in this state.

Wisconsin, Michigan, New Hampshire, Oregon and Colorado are listed as states other than Washington with a definite lake rehabilitation program through the use of rotenone, although none have gone as extensively into this work as has Washington.

Many of this state's most spectacular rehabilitation successes came in the late 1940s and early 1950s, when lakes that had been unproductive for years suddenly came alive and produced phenomenal catches of trout. One 230-acre lake, rehabilitated in 1947 and restocked, yielded 5,460 half-pound rainbow trout to anglers on opening day in 1949. For the season, this one lake produced an estimated 56,000 such catches, compared to the average annual catch before rehabilitation of 1,000 fish.

In 1952, Bay Lake in Pierce County produced 7,350 rainbows, averaging three-quarters of a pound each for 1,050 anglers, on opening day alone; it was in its second year after rehabilitation. Big Twin Lake in Okanogan County, also on opening day in its second season after restocking, produced an actual check of 17,073 fish for 1,486 anglers, with the trout caught averaging about 12 inches long. This on a 79-acre lake!

Today, lake rehabilitation is carried out not only for trout production, but for warmwater species production as well. It is a proven fish management technique that may well deserve the title of an "angler's best friend." □



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